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AUTHOR	Wells, D.; Torrie, J.; Prindle, L.
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ABSTRACT

This study examined the role played by emotional intelligence on occupational success, seeking to correlate college grades with measures of emotional intelligence. The study, conducted at a Canadian community college, involved two student populations: an adult education group and a group of automotive service technicians in a pre-employment center. The BarOn EQ-1 test of emotional intelligence was administered to both groups in the winter 2000 term. The test gives scores in five general areas: intrapersonal, interpersonal, adaptability, stress management, and general mode, suggesting that it could yield information that would enhance student development. The adult education group (n=41) was tested at the end of a year of school experience; one group (n=12) of automotive technicians was tested at the end of their first year; the second group (n=9) was tested at the end of the two-year program. While the study results showed some small positive correlations between shop grades in the second year of the program and total scores on the test, the small sample size and the possibility of confounding variables limit the conclusions that can be drawn from this research. (Contains 14 references.) (MKA)

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D. Wells, J. Torrie, L. Prindle

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Exploring Emotional Intelligence Correlates in Selected Populations of College Students

D. Wells, J. Torrie, L. Prindle

Abstract

Emotional intelligence may play a significant role in occupational success. Do college grades correlate with measures of emotional intelligence? Positive correlations would suggest that college graduates are leaving with these skills. To measure this possibility, the BarOn EQ-I, a test of emotional intelligence, was given to two populations: one in an adult education, and another in an automotive service technician program. The results showed some small positive correlations in the range of .5 between shop grades in the second year of the program and total scores on the EQ-I test. Small sample size and the possibility of confounding variables limit the conclusions that can be drawn from this piece of preliminary research.

Background

Issues

Student success motivates many instructors and administrators at Lethbridge Community College. Part of understanding student success is to identify concepts, or measures, that would allow us to describe factors that might lead to student failure and to work to ameliorate those problems. LCC has an extensive set of structural supports, academic assessment, learning support, counseling - both personal and career, in place to facilitate student success.

Twenty years ago, we thought primarily in terms of course content; we concentrated upon delivering the need to know and the nice to know. However, in the past five years, we, as an institution in the broad sense, that includes both staff, administration, and advisory committees, have begun to notice, that we may not be enhancing student success quite as effectively as we once thought. Our understanding of the skills necessary for student success began to shift. As our understanding of our students and their needs shifted toward the "soft skills" as identified by the Conference Board of Canada, we began to recognize that we may need to alter our curriculum delivery paradigms. Whereas we once followed operant conditioning paradigms such as those put forward under the influence of psychologists like BF Skinner, we now recognize a need to shift to more constructivist paradigm that takes a more holistic view of learners and the learning process.

Lacking clear descriptions of our students and what they needed, we were left to follow hunches and intuitions. Recognizing the problematic nature of this situation, we elected to formalize our concerns and initiated a formal research project that would enable us to describe our students more objectively. We wanted to collect baseline data against which we could chart the changes in our students over time. We can respond more effectively to problems that we can clearly identify and describe.

A few members of our institution were following some of the research that was developing in psychology in the middle of the 1980's. In particular, people began to follow the work of Howard Gardner. Gardner argued that the traditional views of intelligence were just too narrow to capture, in any realistic sense, the flux and flow of human intelligence. There was more to intelligence than can be accurately described on the verbal and performance scales that typified modern intelligence tests. Gardner argued for what he described as multiple intelligences. Intelligence, in this sense, was to be understood as a matrix of skills and abilities operating together over time.

One of the dimensions of Gardner's work that captured a great deal of attention was the distinction between interpersonal and intrapersonal intelligence[1]. Intrapersonal intelligence was the ability to know and understand yourself, your motivations and desires. Interpersonal intelligence was the ability to read and relate to the intrapersonal intelligence of other persons. Goleman redefined this kind of intelligence as emotional intelligence which includes, "self-awareness, impulse control, persistence, zeal, self-motivation, empathy, and social deftness."[2] Goleman and his followers would suggest that this form of intelligence is very important:

> Emotional intelligence matters for school achievement, job success, marital happiness, and physical health. Goleman discussed the recent research finding that people who are chronically anxious, sad, or depressed have double the risk of getting a major disease - a higher risk than smoking.[3]

The exploration of emotional intelligence garnered a lot of interest in the business community in part as companies struggled to ensure that their workforces stayed competitive in the modern market place. For instance, the website http://www.eiconsortium.org/ sponsored by the Consortium for Research on Emotional Intelligence in Organizations drew over 8800 hits in three months. A quick review of the business literature showed that the topic of emotional intelligence attracted considerable interest in a wide range of publications.[4]

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[1] Pamela LePage-Lees, Exploring Patterns of Achievement and Intellectual Development Among Academically Successful Women from Disadvantaged Backgrounds, Journal of College Student Development, September/October 1997, Vol 38, No 5 p 469

[2] Pamela LePage-Lees, Exploring Patterns of Achievement and Intellectual Development Among Academically Successful Women from Disadvantaged Backgrounds, Journal of College Student Development, September/October 1997, Vol 38, No 5 p 469

[3] Carolyn R. Pool, Up with emotional health (emotional intelligence as a predictor of personal success), Educational Leadership, May 1997 v54 n8 p12(3)

[4] Here is a short list of business related references: James Traub, Multiple Intelligence Disorder in The New Republic, Oct 26, 1998 p20(1); Jennifer J. Salopek, Train your brain in Training & Development, Oct 1998 v52 n10 p26(8) ; Anne Goleman, Fisher Daniel, Success Secret: A High Emotional IQ (emotional intelligence more important than technological skills)in Fortune, Oct 26, 1998 p293(1); Rebecca Abraham, Emotional Intelligence in Organizations: A Conceptualization in Genetic, Social, and General Psychology Monographs, May 1999 v125 I2 p209(1); Jennifer Laabs, Emotional intelligence at work (tips in conducting emotional intelligence training) in Workforce, July 1999 v78 i7 p68(4); Robert K. Cooper, Applying emotional intelligence in the workplace in Training & Development, Dec 1997 v51 n12 p31(8); Shari Caudron, The hard case for soft skills(includes related articles on emotional intelligence and guidelines in behavioral-skills training)(role of emotional intelligence in the performance of employees) in Workforce, July 1999 v78 i7 p60(7)

Several authors explored the concept of emotional intelligence and its impact upon academic performance. Shepard, Fasko, and Osborne[5] argued that we need to rethink our understanding of intelligence and how it developed in the classroom. Specifically, they stressed the need for students to be allowed to encourage their emotional intelligence. LePage-Lees[6] observed that academically successful women from disadvantaged backgrounds who had undergone stress as children developed higher degrees of emotional intelligence. And, "When this emotional intelligence was encouraged, the women's academic performance improved."[7]

However, work in this area was not without some controversy for as Davis, Stankov, and Roberts suggesed, the factor of emotional intelligence, "... is narrower than that postulated within current models of emotional intelligence."[8] Finegan in her paper, *Measuring Emotional Intelligence: Where Are We Today*, suggested, following the work of Mayer and Salovey, that we have no clear view yet of the "... paradigm to be used in teaching emotional intelligence skills as a part of general curricula."[9] According to Bernet[10] the difficulty arose, in part, because of a lack of agreement with respect to the meaning of emotional intelligence. Without objective agreement about the nature of what was being measured, we cannot expect research to supply answers to questions.

LCC we took a proactive approach and initiated a study into the relationship between emotional intelligence and students' performance. We studied two populations of students using the BarOn Test of Emotional Intelligence. The BarOn test has not been used extensively in educational circles to date. Searches of the Psychlit and Eric data bases yielded no hits. A request sent through the ACCC list serve for people familiar with the use of this tool yielded only four replies.

We selected this test for four reasons. First, there was no clear agreement in the field of psychology exactly what emotional intelligence is and how it should be measured, so the BarOn test was as reasonable an instrument to use as any. Second, it was one of the instruments recommended by the Consortium for Research on Emotional Intelligence in Organizations. Thirdly, using an instrument that was being used in the business community would help to validate our research as we could correlate our results with results from the business community. Fourth, we had staff who were certified to give and to interpret the results of this test.

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[5] Richard Shepard, Daniel JR. Fasko and Francis H. Osborne Intrapersonal Intelligence: Affective Factors in Thinking. Education, Summer 1999 v119 i4 p633

[6] Pamela LePage-Lees, Exploring Patterns of Achievement and Intellectual Development Among Academically Successful Women from Disadvantaged Backgrounds, Journal of College Student Development, September/October 1997, Vol 38, No 5

[7] Pamela LePage-Lees, Exploring Patterns of Achievement and Intellectual Development Among Academically Successful Women from Disadvantaged Backgrounds, Journal of College Student Development, September/October 1997, Vol 38, No 5 pg 468

[8] Michaela Davis, Lažar Stankov, and Richard Roberts, Emotional Intelligence: In Search of an Elusive Construct, Journal of Personality and Social Psychology, 1998, Vol. 75, No 4, 989-1015 pg 989.

[9] Jane E Finegan, Measuring Emotional Intelligence: Where Are We Today, Presented at the Annual Meeting of the Mid-South Educational Research Association, (New Orleans, LA, Nov 4-6, 1998) ERIC ED426087

[10] Michael Bernet, Emotional Intelligence Components and Corrleates, Paper presented at the Annual Meeting of the American Psychological Association, (104th, Toronto, ON, Aug 9-13, 1996) ERIC ED408535

So although we recognized that work in this area is controversial, we thought we had good reasons to proceed with this project at this time using the resources that were available to us. Our work broke relatively new ground in educational circles.

BarOn Emotional Quotient Inventory

The BarOn certification program defined emotional intelligence as:

> EI is an array of noncognitive capabilities, competencies, and skills that influence one's ability to succeed in coping with environmental demands and pressures.[11]

The test gives scores in five general scales: the Intra-personal, the Inter-personal, the Adaptability, Stress Management, and General Mood. Each of these scales has also been subdivided into a number of other scales.

The test can be used to collect either individual, called developmental, or group norms. The developmental and group report suggested strategies for improvement on those scales that yield the three lowest scores. This suggested that the test may well serve as a useful device and yield good information that would enhance student development.

Purposes of the Project

We identified four purposes to conduct our research. The purposes of this study are:

- to gather an LCC baseline of data using a BarOn EQI test.
- to compare and correlate BarOn scores pre and post instruction.
- to correlate BarOn post program scores with other measures of student achievement such as grades on practicums, work experience, or shop experience.
- to evaluate the BarOn instrument to see if it provides information that will inform teaching practice here at LCC.

Method

In the Winter 2000 term, we measured two populations of students: a group in our Access Centre , an adult upgrading population, and a group in our Industrial Training Centre, a group of Automotive Service Technicians in a pre-employment program.

The Access group was tested at the end of a year of school experience. Because we identified this as an "at risk" group, and we wished to minimize any problematic ethical situation as researchers and as an institution, we elected to collect this data in the form of a group test.[12] We chose to study students who were near exit markers in the

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[11] Steven Stein, Mental Health Services EQ- i Certification Program, Section B pg 3

[12] For instance, suppose we have given a test and know from the results of this test that a particular student is at risk. If we failed to respond to the needs of that student, and if something untoward were to happen, we as individuals and as an institution would have to be prepared to be at least indirectly involved as a causative factor in that student's behavior. This is certainly a significant ethical risk to take unless we, as an institution, are prepared to intervene actively in the lives of the students that we test. These interventions that may be required would move us far beyond the purposes of our study, and be very costly. Yet, by starting the process and not being prepared to finish it, we put ourselves unto questionable ethical grounds. By using the group reporting norms, we can avoid these sorts of problems while still collecting information that would help us to address questions one and two. It turned out that this concern was unfounded as none of the students scored in ways that would be problematic.

program. Our test sample included: fifteen students from English 33, five students from Math 33, twenty-one students from Reading 035. Before administrating the test, we informed the students about the purposes of the project and the tests. After the results were interpreted, we allowed for one-hour group interpretation session in the Access Centre with instructors from the Access Centre. Because of time constraints, we were not able to give the students any collective feedback.

Two groups from the Industrial Training Centre were tested. One group of twelve students was at the end of their first year while the second group of nine students was at the end of their two-year program. With these groups we collected individual scores.[13] We also spent time going over the purposes of the test with this group. And again, after the results were interpreted, we allowed for one-hour group interpretation with the instructors as well as allowing for individual interviews with each student.

[13] Because we anticipate that this group would be a less "at risk" group, we should be able to avoid or minimize some of the concerns raised above

Results

The BarOn Test yields a total score which is broken down into five subscales. Each subscale is in turn further subdivided into more subscales. Please consider Table One that shows the means and variances of all the groups [14]:

Table 1
The means and variances of the subgroups on the scales and subscales of the BarOn Test

		Access (41)	s	AST 1 (12)	s	AST 2 (9)	s
	Total score	97	14.9	99	12.9	103	9
Intrapersonal		99	15.3	101	13.8	104.5	12.8
	Self-regard	100		101.8	10.9	108	10
	Self-awareness	99		98.6	13.2	102.3	16.5
	Assertive	100		103.1	16.6	98.2	11.2
	Independence	99		101.4	12.9	99.4	10.3
	Self-actualization	98		100.2	10.4	108.1	12.8
Interpersonal		96	13.3	95.3	12.8	95.6	9.5
	Empathy	97		95.1	14.6	88.2	13.6
	Responsibility	99		92.5	11.2	90.8	14.5
	Relationships	97		97.9	11.9	100.7	12.3
Adaptability		98	15.2	99.4	12.8	103.2	5.9
	Reality testing	97		97.2	10.5	104.4	8.9
	Flexibility	101		102.6	13.7	104.5	10.7
	Problem solving	99		98.6	12.5	98.8	15.1
Stress Management		97	12.9	97.1	9.3	103.4	9.3
	Stress tolerance	99		98.6	12.1	105.7	12.2
	Impulse Control	96		97.4	7.5	100.7	10
General Mood		96	15.4	99.2	9.5	107.1	9.4
	Optimism	96		96.8	10.7	100.4	11.3
	Happiness	96		101.5	8.4	112	6.2

The BarOn test was designed to yield mean scores of 100 with a standard deviation of 10 units. Performing a T test on the means shown on Table One indicated that these groups were not significantly different.

[14] For further details upon the contents of each sections please see the materials supplied by Jamie Torrie

We correlated the scores assigned on the shop components of the course with the scores on the subtests of the BarOn Test. Table Two shows these scores for the twelve first year Automotive Service Technology students while Table Three shows the scores for the nine second year Automotive Service Technology students.

Table 2
The correlation between instructor assigned shop marks for Year One Automotive Service Technology students and the scores from the five major subscales of the BarOn Test.

	Intrapersonal	Interpersonal	Adaptability	Stress-Management	General Mood	Total
Effort	.10	.21	.32	.15	.11	.08
Co-operation	.07	.25	.26	.23	.13	.06
Assignments	.13	.23	.35	.07	.04	.04
Organization	.11	.11	.32	.04	.02	.06
Employability	.22	.17	.32	.11	.10	12
Total	.12	.20	.37	.13	.05	.08

Table 3
The correlations between instructor assigned shop marks for Year Two Automotive Service Technology students and the scores from the five major subscales of the BarOn Test.

	Intrapersonal	Interpersonal	Adaptability	Stress-Management	General Mood	Total
Ability	.19	.44	.14	.05	.26	.19
Attitude	.38	.74	.42	.49	.34	.58
Interaction	.17	.39	.47	.63	.17	.40
Attendance	.56	.40	.44	.13	.43	.55
Total	.48	.53	.41	.28	.41	.55

It needs to be reemphasized that we were working with very small populations, so we need to be cautious in extrapolating the results.

Discussion

Table One indicated that these populations were not different as measured by the mean scores that they obtained on the BarOn tests. They fell easily within the normal range of scores associated with this instrument. In terms of the test means with these populations, we could not make any valid claims that the second year experience impacted, or failed to impact a students skills as measured with this instrument. We could only make this inference if we were to follow these populations over time. Following the first year students into their second year will give us some insights as to the impact of the second year of instruction on a student's scores. Our small sample sizes would dictate that to have confidence in our judgements in this area we would need to follow this testing procedure for several years.

Where we did notice a difference was in the variability of the scores. Moving from the Access population through year one and year two of the Automotive Service

Technology population, the variability decreased. This may be a normal event that followed from the selectivity promoted by choosing a particular program and by staying in and completing the program.

However, other factors may also be at play. It could be an age related factor. Perhaps older populations are more homogeneous than younger populations. It could be a temperament factor relating to populations in this vocational area. Perhaps Automotive Service Technicians are a very homogeneous group. Or, it may just be a function of small sample size. One or all of these populations may not have been typical.

Following up on some of the ideas presented above, we checked on the ages of these two groups. We found that the modal ages for the year one group was 18 and 19 while for the year two group it was 20 and 21. Thus it seems as if there may be an age, or experience, factor at work that explains some of the change in variability between the two populations in the Automotive Service Technology groups.

Tables two and three showed us some interesting correlations that allowed us to address the third purpose in doing our study. We noted that in the year one group there were virtually no correlations at all. However, in the year two group there were several stronger correlations: attitude by interpersonal being the highest at .74. The test totals correlated at .55. This difference suggested that something changed, either as a function of the populations, or as a function of the program.

We followed up on these observations, and we shared these results with instructors. They indicated that these results may not be surprising given the way that they structured their program. The first year of the program was designed to sort the students. Students who came back for the second year know what the trade entails and know that they have the aptitudes and skills necessary to succeed. In the second year, they were inculcated into the trade, so that upon graduation they can move into employment and be successful. Our preliminary data would suggest that students, in their second year, are being graded, in part, upon criteria that correlate with the softer skills being measured by the BarOn test.

We collected informal instructor feedback about the results of the testing program and how it might inform their teaching practice. The feedback varied according to the types of norms the teachers worked with. If the results of a testing program were to be used to inform classroom teaching practice, then the test with group norms would need to be administered early in the term. If the results were to be used to guide students, then the test using individual norms could be administered anytime in the first three quarters of the term so that there was adequate time to report to the students and to follow up with the students. Some teachers indicated some reservations about knowing too much about students for fear that they might inadvertently find themselves being biased in their grading toward students.

A general consensus seemed to be that individual norms should be available to students, but that instructional practice is reasonably informed using group norms early in the term.

Implications

Several interesting possibilities follow from this first piece of research. The following unordered list is presented to promote further discussion.

The means reported on Table 1 showed us that, collectively, our students are functioning in a normal range. This begs the question of changing our instructional practices if we assume that we are content with students who are functioning in the normal range. To move our student population average above the general population average may require a significant institutional commitment to change.

Perhaps we should limit our use and involvement with this test to a guidance model. We would give students the opportunity to take this test for their own purposes but we would not try to use the individual results of this test directly in regular classrooms.

Will we find these skills teachable? Given the ongoing debate on this topic in the psychological literature, are we simply trying to move too fast? Do we have the desire and resources necessary to pursue what may actually be a dead end?

If we followed these students over an extended period, we might see some interesting relationships develop between their work histories and their scores on the BarOn test. Following the year one cohort through their second year, would allow us to see if some of the changes that we noted were a function of the second year experience, or just a function of a particular cohort of students. If we were to collect this data over a longer period of time so that we had larger sample numbers, then we could begin to use statistical techniques to explore the data.

It would be interesting to expand our populations studied. For instance, we observed a difference in variance between the more general students such as those leaving the Access program and those in the second year, of the Automotive Service Technology program. It would be interesting to compare General Studies students with students in more defined programs such as Criminal Justice or Nursing to see if this trend continued.

The Criminal Justice Centre has a number of options. It would be interesting to explore the populations that are successful at the various options to see if the BarOn test would provide students with useful information about their chances of success or satisfaction in choosing a particular option. The BarOn test might be a useful guidance tool.

The instructor could examine their marking criteria to see if it was desirable to modify their grading systems to produce a stronger correlation. For instance, is there a value in trying to tie instructor based grading to outside criteria such as the BarOn test? Or, is it better to create grading frameworks based upon other external criteria such as might be identified by an advisory group? Or, is it best to use only frameworks developed upon internal criteria that the instructors control? There are many interesting discussions that could evolve around the whole area of grades, criteria for grades, uses of grades, validation of grades and etc.

This piece of research has promoted more questions than answers given our small sample size and limited range. This is to be expected. However, it is also interesting to note that whenever we step outside our normal practices, we begin to notice things we hadn't thought of before, or we begin to notice practices that we had taken for granted as

given. Perhaps a step outside our normal practices is always worthwhile just to help us think more about what we do.